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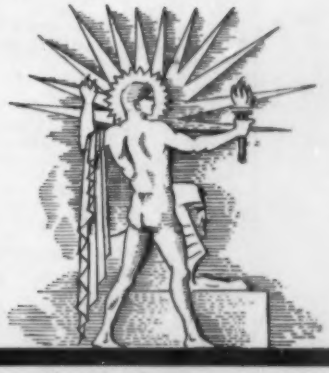
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



MARCH 10, 1934

A Crash For The Camera

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VOL. XXV No. 674

The Weekly Summary of Current Science

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Edited by WATSON DAVIS

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DO YOU KNOW?

A new factory in Sweden is to produce enough aluminum to meet Swedish requirements.

Cream in aluminum foil containers, holding enough for one cup of beverage, is sold cheaply in Germany.

A Cornell University professor will soon sail for China to aid in research there to improve the diets of Chinese farm families.

In making the faces of the queer characters of the film, "Alice in Wonderland," ingenious movie laboratories devised flexible rubber masks which fitted the actor's faces.

That mythical beast, the Chinese dragon, is described in old books as having a camel's head, deer's horns, a snake's neck, a clam's stomach, fish's scales, eagle claws, and the ears of a cow.

From Europe comes the announcement of a new textile fiber incorporating flax and rayon.

Observers who have risen into the stratosphere in balloons describe the sky as being of a deep purple color.

Roads that are being built in the United States under the Public Works administration would add up in mileage to six transcontinental highways.

For automobile mechanics and other workers who need a spotlight, a new two-bulb light has been devised, which is worn above the eyes and connects with a pocket battery.

Government figures show that 80 to 90 per cent. of the money for a concrete road is ultimately paid out in salaries and wages, though only about 15 per cent. goes to workers on the actual site of road construction.

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These curiosity-arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information for the article, but the references for further reading. Books cited can be supplied by Book Department, Science News Letter, at publishers' prices, prepaid in the United States.

PHYSICS

Man-Made Radioactivity Achieved at Pasadena

Using No Natural Radioactive Materials, Americans Follow French Experiments and Get More Lasting Disintegration

ALL THE newly discovered particles of physics—deuton, positron and neutron—cooperate in one grand experiment to produce a new case of the remarkable artificial radioactivity discovered in Paris a few weeks ago. (*SNL—Feb.* 10, '34, *p.* 83; *Mar.* 3, *p.* 133.)

It was found at the California Institute of Technology, Pasadena, , that when deutons, which are heavy hydrogen nuclei, are driven at carbon atoms by a high voltage tube, positive electrons are produced in great numbers. It is known that neutrons are also formed. But in this case they are not the center of interest. The positive electrons attract more attention because they continue to shoot out from the carbon for many minutes after the deuton bombardment is stopped. Their number drops fifty per cent. every ten minutes.

These experiments were performed by Prof. C. C. Lauritsen and two graduate students, R. Crane and W. Harper. Definite results were first obtained on Monday, Feb. 26. They took a hint from the French husband-wife research team, M. F. Joliot and Mme. Irene Curie-Joliot, who first found that boron bombarded with radioactive alpha rays continued to give off positive electrons of the same duration as in the Pasadena experiments. Evidently, the same products are formed in the two cases.

The American method is especially significant in view of the fact that no natural radioactive materials are required. All the energy is generated by man-made apparatus. Nevertheless, the number of positive electrons is hundreds of times greater than in the French experiments. Other substances are being investigated for similar effects and other products of the activity are being searched for.

There is no way of telling what the practical applications of the new effect will be but they will probably be important. The theoretical consequences are of the utmost significance. Entirely new elements may be formed and studied to give information which could never be obtained from the materials which nature provides.

Artificial radioactivity that lasts for a longer period than ever before achieved has resulted from a stream of million volt particles launched against targets of light elements in more recent experiments at the California Institute of Technology.

The same scientists, Prof. Lauritsen and Messrs. Crane and Harper who had previously found that artificial radioactivity persisted over an hour after bombardment of carbon by deutons, or heavy hydrogen hearts, have tried bombardment of boron with the result that the activity was found to last even longer. The stream of million volt particles consisted of alpha particles, protons and deutons, but probably the deutons were the effective projectiles.

The resulting activity from boron was less at first than that from carbon but it lasted much longer. Instead of dropping to half in ten minutes, the boron product took twenty minutes to fall to half value.

Presumably the sequence of events in the case of carbon is as follows: The deuton enters a carbon nucleus and kicks out a neutron. This act transforms the carbon into a peculiar form of nitrogen, which has a mass of thirteen instead of fourteen or fifteen. The freak nitrogen cannot live long because it has an excess of positive charge. Spontaneously it ejects a positive electron and thereby turns into carbon again.

The positive electrons have been seen in a Wilson cloud chamber and have been counted in various electrical devices. Their energy runs up to more than half a million volts. This they spend in breaking up atoms in their path. The broken atoms or ions give the clues by which the positrons are detected. When their energy is nearly spent negative electrons seek out the positives and join with them. The positive cancels the negative and the energy goes off as a pair of photons. Prof. Lauritsen and Mr. Crane have observed these photons and found that they disappear at just the same (*Turn page*)

MEDICINE

Injections Lengthen Life Of Tuberculous Rabbits

RABBITS suffering from experimental tuberculosis live much longer when doses of an iron salt, ferric chloride, are injected into their veins, Dr. Valy Menkin of Harvard Medical School has found.

In a report to *Science*, Dr. Menkin states that whereas animals without the iron salt treatment lived, on an average, 81.4 days after infection with tuberculosis, the average life span of the animals treated with the iron salt was 198 days, up to the time when two survivors of this latter group were sacrificed for examination.

Hope for a specific method of successful treatment for human tuberculous patients is, of course, aroused by reports of the investigation, but it is far too early to apply these results with laboratory animals to human beings.

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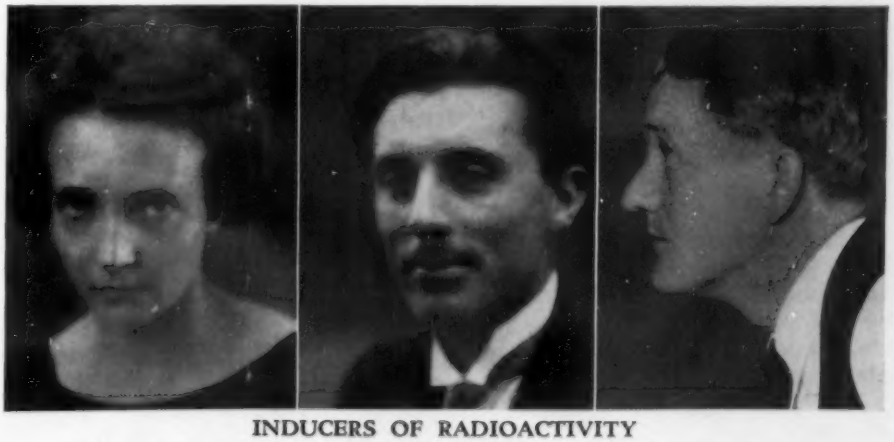
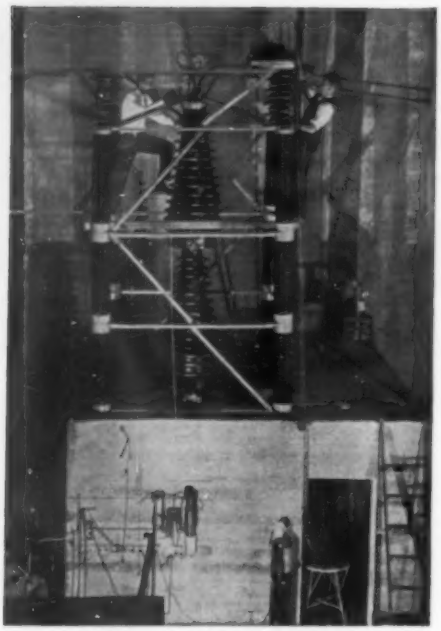


INDUCERS OF RADIOACTIVITY

Left to right—Mme. Irene Curie-Joliot, F. Joliot and Dr. C. C. Lauritsen.



VETERAN WEAPON

This is the high voltage tube at California Institute of Technology which has been an unusually formidable weapon in the attack on the atom.

rate as the positive electrons.

In the case of boron and deutons the unstable nucleus formed after the ejection of a neutron would be carbon of mass eleven. Both positive electrons and photons or gamma rays have been observed in this case also. Lithium has been tried but gave feeble results. Moreover the half life is the same as for carbon so it is likely that a slight carbon impurity is responsible for the after effect. More experiments are in progress.

British Continue Experiment

Artificial radioactivity has been produced at Cavendish Laboratory in Cambridge by bombarding graphite with high velocity protons. This man-made radioactivity confirms and extends the work of the French scientists.

Drs. J. D. Cockcroft, C. W. Gilbert and E. T. S. Walton speeded the hydrogen nuclei or protons to a high velocity with the same 600,000 volt tube that has previously performed important atomic transmutations. Positrons or positive electrons were produced.

The new radioelement produced lost half its activity in ten minutes. The scientists believe that the radioactive element formed in nitrogen of mass 13 is created by the addition of a proton to the ordinary carbon mass 12 of the graphite. A report is published in *Nature*.

PLANT PHYSIOLOGY

Plants Retain Heavy Water In Formation of Tissues

PLANTS retain "heavy water" which they take out of the general water supply, and build it into their woody tissues and into the starches and other carbohydrate foods they form. Although it is present only in very minute proportions in the normal water of the soil and of rivers, the plants are in some way able to select it out, so that a larger ratio of it is present in the water bound up in wood and carbohydrate than is present in the "normal" free water which the plant takes in.

This selective action of plants on heavy water was found to be true for willows, in experiments performed at the National Bureau of Standards by the late Dr. Edward W. Washburn and his associate, Dr. Edgar R. Smith. Dr. Washburn, pioneer investigator of heavy water, which contains atoms of the recently discovered double-weight hydrogen, or deuterium, died suddenly on Feb. 6; the report by himself and Dr. Smith has been published posthumously in *Science*.

Dr. Washburn and Dr. Smith thought that plants might exercise a selective action on the minute amounts of heavy water that occur mixed with the general supply of normal water. They decided to test their scientific "hunch" by growing plants with their roots in water, and then analyzing the water bound up in their compounds for its fraction of heavy water.

At first they had hard luck. A big pot of cow peas was coming along nicely, when aphids got into the plants and killed them. Then they tried a pot of corn, only to have it killed by cold.

Finally they grew several cultures of rooted willow shoots, both in normal Potomac river water and in water with a high ratio of heavy water made in the laboratory. These experiments went through successfully.

In every case, they found that the selective action of the plants did not take place on the water as it was absorbed. The water left in the pot after the willows had been absorbing from it for a long time was unchanged in its weight.

But when they subjected the willow shoots to chemical analysis and tested the weight of the water distilled out of their tissues, they found a different story. One fraction of the water, representing the sap, was uniformly 2.8 parts per million heavier than normal water, representing that ratio of excess of heavy water. A second fraction of the water, obtained by heating the willow tissues to destruction, was, on an average of three samples, 5.4 parts per million heavier than normal water.

The report of the two scientists does not undertake to decide whether this selectivity by the plant is beneficial, harmful or neutral in its effects. This, they state, can be determined only by further experiments. It is known, of course, from experiments by Dr. Washburn and other scientists, that in high concentrations heavy water is harmful to living plants and animals.

One outcome of the experiment is the suggestion that the natural plant products, oils, carbohydrates, etc., may be expected to contain an abnormal amount of heavy hydrogen, if all plants show the same selective action on heavy water that was discovered for willows.

HISTORY

Lost History Sought In Mosque of St. Sophia

THE CHURCH of St. Sophia in Istanbul, which Turkey's modern ruler, Kemal Pasha, has generously opened to scientific inspection, may yield important facts about an empire which is a medieval mystery.

This is the hope of Prof. A. A. Vasiliev, of the University of Wisconsin history faculty, who is completing plans to sail for Istanbul. Research funds have been granted him to study St. Sophia's mosaics and manuscripts which are for the first time in 400 years being shown to western scholars. Since the fifteenth century, when the Turks captured Constantinople, the great church of the Roman Emperors of the East has been a Moslem mosque and a harbor for mystics and scholars of Moslem faith.

Now, American scholars cooperating with Turkish officials are removing the masks of plaster and paint that devout Moslems laid over the glittering, color-

ful mosaic pictures of Christian art in the church.

Prof. Vasiliev will examine the mosaics so far uncovered, and will search the manuscripts stored in old crypts and vaults of the building, for light on the little-known Empire of Trebizond. On the history of this Empire, Prof. Vasiliev is a leading authority, although Arabic and Byzantine manuscripts have yielded him only a smattering of information.

Exploring the riches of the St. Sophia documents, Prof. Vasiliev expects to use no less than a dozen languages in his effort to re-establish in history an almost forgotten empire.

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METEOROLOGY

Winter Tornadoes Rare But Causes Are "Orthodox"

WINTER tornadoes, such as the storms that took two score lives in the South on Sunday afternoon, Feb. 25, are unusual only in the season of their occurrence, scientists of the U. S. Weather Bureau told Science Service. The basic physical causes that bring tornadoes into existence are the same, whatever the season.

The state of great atmospheric instability that can start these intense twisting air-whirls is set up most commonly by the inflow of a cold air mass at a relatively high level—6,000 to 15,000 feet—riding over a mass of warm air that hugs the ground. Such an extensive "temperature inversion" is an invitation to the two air masses to mix and overturn—and if the overturning is rapid enough, swirls of tornadic force are the result.

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▼ RADIO ▲

FOLLOWING DARWIN'S TRAIL IN SOUTH AMERICA

an address by

Dr. W. H. Osgood

Curator of Zoology, Field Museum of Natural History

Wednesday, March 14, at 4:30 p. m., Eastern Standard Time, over Stations of the Columbia Broadcasting System. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.

PHYSIOLOGY

Baby Rabbits Born Normally After Fertilizing in Glass

Harvard Physiologists Succeed with "Ectofertilization" And Development of Ova by Foster Mother

BABY RABBITS, developed from eggs that were fertilized outside the mother's body and brought to birth in the body of a second mother rabbit, have been produced in the Harvard University laboratory of general physiology by Prof. Gregory Pincus and E. V. Enzmann. These little rabbits, "fathered" in a glass flask by sperm extracted from a male rabbit, may be looked upon as the first actual approach to "ectogenesis," or "babies born in a bottle," about which scientists with a romantic bent, like J. B. S. Haldane, have been dreaming for years—though it is admittedly still a long way from realization for human beings.

Each of the two litters of "ectofertilized" rabbits which Prof. Pincus and Mr. Enzmann have succeeded in obtaining may in a sense be said to have had three fathers and two mothers, for in each case three male and two female rabbits were required for the process. In the strict biological sense, of course, the real mothers were the females that supplied the ova and the real fathers were the males that supplied the sperm; the others would rate more as auxiliary or foster parents.

To produce their "ectofertilized" rabbits, the Harvard scientists first mated a female rabbit with a male which had been rendered incapable of producing sex cells by a simple surgical operation. The mating act stimulated the first steps in the development of the ova, or female sex cells, which however, still remained unfertilized.

Then the ova were removed from the mother rabbit's body and placed in a suitable fluid in a glass vessel. Sperm from a normal male rabbit was added, and allowed to remain with the ova until each one had received the fertilizing male cell. Certain changes observable under the microscope indicated to the watchers that this process had taken place.

In the meantime, the "foster-mother" rabbit had been prepared for her role by being mated with another male incapable of producing functional sex cells. Into her maternal tissues, thus stimulated to activity, the ova of the other rabbit, fertilized in a glass vessel with the sperm of a male she had never seen, were introduced. They developed, and in due time the young rabbits were brought forth.

In order to have a check on the correctness of their technique and to make sure that the second mother rabbit's own ova were not chance-fertilized by stray sperm-cells, rabbits of different breeds were used throughout, so that the coat color of the young ones would indicate their actual parentage. This was in both cases indubitably traceable to the ova and sperm cells in the glass vessel.

(*Turn Page*)

ANTHROPOLOGY

South Sea Wood May Reveal Life of Ancients

A NEW way of tracing the origin and early activities of Polynesian peoples is to be tried by Yale scientists.

The new attack on the problem will be an investigation of over 2,500 wood specimens from remote islands of the South Seas. By studying these samples of wood, and comparing them with old wooden implements used by Polynesians, the Yale School of Forestry hopes to learn more about where the islanders came from, and with what regions they had contact.

The collection of South Sea woods has been given to the School of Forestry by the Bernice P. Bishop Museum of Honolulu, and is intended for use in the systematic study of woods of the entire world now being sponsored by Yale in cooperation with the International Association of Wood Anatomists.

The Bishop Museum specimens are pronounced of exceptional value because nearly all were obtained by scientists on expeditions to remote localities in the Pacific.

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In reporting their biological triumph to the National Academy of Sciences, Prof. Pincus and Mr. Enzmann comment, "We believe, therefore, that this is the first certain demonstration that mammalian eggs can be fertilized in vitro."

The way for the experiments of the two Harvard physiologists was prepared by the work of earlier research men, to whom their communication gives due credit. That fertilized egg cells could be transplanted from the body of the mother animal into the body of another female, where they would then go through normal development, had been demonstrated as early as 1905 by an English physiologist, W. Heape, and his results had been confirmed in 1922 by a German group, A. H. Biedl, H. Peters and R. Hofstätler. Prof. Pincus had obtained similar results in 1930, but his effort to carry the process one step further had not then succeeded.

Babies born in glass flasks in the laboratory, instead of being brought forth by human mothers in the age-old painful way, have been a dream of modern biological romancers, just as the "homunculus," or synthetic little human being, was one of the dreams of old-time alchemists. In a little book called "Daedalus, or Science and the Future," published ten years ago, J. B. S. Haldane prophesied the "birth" of the first ectogenetic baby in 1951. But even with the success of Prof. Pincus and Mr. Enzmann before them, scientists hardly expect, in so near a future, that particular type of "blessed event."

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SEISMOLOGY

Chilean Mountains Shaken by Earthquake

THE MOUNTAINOUS region northeast of Valdivia, Chile, was the scene of a fairly severe earthquake on Thursday afternoon, March 1, seismologists of the U. S. Coast and Geodetic Survey decided after examining instrumental data obtained from five observatories by Science Service.

The epicenter was located in 39.5 degrees south latitude, 72.5 degrees west longitude, and the time of origin was 4:45.4 p. m., E.S.T.

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A plant under construction at Regensburg, Germany, will produce alcohol and saccharose products from wood.

SEISMOLOGY

Observing Ground Tilt May Aid Earthquake Prediction

PREDICTION of earthquakes a few hours before they occur may be possible in the future as a result of studies that have been made in Japan, Capt. N. H. Heck, chief of the U. S. Coast and Geodetic Survey's division of terrestrial magnetism and seismology, declared before the Brooklyn Academy of Arts and Sciences.

In a number of earthquakes there was perceptible tilt of the ground several hours before the earthquake, Capt. Heck said. In one case the villagers observing the tilt, feared a tidal wave and took to the hills. The tidal wave and earthquake came later.

A new machine for measuring tilt of the ground has been invented by George E. Merritt, formerly of the U. S. Bureau of Standards, and installed in California through the cooperation of the U. S. Coast and Geodetic Survey and the University of California. This apparatus is expected to throw new light on California's earthquake problems. Tilt on a large scale and the creep of the earth's crust, known to be a factor in earthquake production, can be detected through triangulation and leveling, such as is being undertaken by the Coast and Geodetic Survey.

Prediction of earthquakes, however, lies in the future, Capt. Heck emphasized. We now have, he said, no possibility of prediction beyond indicating whether or not a certain region is likely to have an earthquake in the not too distant future.

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ECOLOGY

Buttresses Formed on Cypresses By Action of Air and Water

CYPRESS buttresses, those curious wide outgrowths that develop around the bases of these water-dwelling trees, are formed only when air and water have a chance to act together on the wood-forming tissues. Cypress trees growing on permanently dry land, or with their roots permanently covered with deep water, are alike in not forming buttresses.

So state Prof. Herman Kurz of Florida State College for Women, and Dr. Delzie Demaree of Stanford University, in the current issue of *Ecology*. Prof. Kurz has had unusual opportunity for observing cypresses in the vast swamp-forests of northern Florida, and Dr. Demaree has made a special study of the trees of the Reelfoot Lake region in northwestern Tennessee, where great areas of already existing forest were partly submerged by the great New Madrid earthquake of over a hundred years ago.

Everywhere the story is the same. Where there is no standing water the cypresses form no buttresses. Where the water level is shallow and constant, the buttresses are low but very wide. Where the water level fluctuates considerably, buttresses of a more or less conical shape develop. An interesting variant of this latter condition was discovered by Prof. Kurz in some moderately deep cypress lakes that went suddenly dry and then re-filled, a season or two ago. Here the tree-trunks had buttresses twelve feet or more high, with "waists" in them, so that they resemble the bottles in which a familiar soft drink is sold.

The form and magnitude of the buttresses are directly proportional to the total time that the various buttress horizons are in contact with air and water. This relation is so clearly revealed by the buttress forms that their profiles may be used to interpret water depth and water level fluctuations of lakes in which cypresses grow.

Dr. Demaree found convincing evidence that buttresses are not necessarily formed around roots, when the water level of Reelfoot Lake sank far below

FORMED BY COOPERATION

normal during recently droughty summers. The trees growing in this lake, which date back to before the great earthquake subsidence, have formed typical buttresses far up their trunks, which were left hanging high and dry by the lowering of the lake level. He terms this type "bell buttresses."

Cypress "knees," conical spongy-wooded upgrowths on the trees' roots, are formed as the buttresses are formed, only where air and water work together, the two botanists state. Botanists hitherto have considered knees as organs of aeration. Prof. Kurz and Dr. Demaree, on the contrary, consider these outgrowths as responses to air and water. They never appear on the roots of dry-land cypresses, and never on cypress roots immersed permanently in deep water.

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PHOTOGRAPHY

On The Front Cover

A HIGH SPEED photograph of what happens when a hammer and a pane of glass meet is reproduced on the front cover of this week's SCIENCE NEWS LETTER.

This picture was made by Prof. Harold E. Edgerton and Kenneth J. Germeshausen of the Massachusetts Institute of Technology at an exposure of 1/100,000 of a second. The camera caught the scene at the moment of impact when the fragments of glass were about to separate.

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HISTORY OF SCIENCE

Civilization Lived With Arabs During Misnamed 'Dark Ages'

Historians of Middle Centuries Said to Have Ignored Arabic Records of Progress in Science and Culture

THE "DARK AGES," modern historians' convenient device for sweeping their own ignorance of the past under the bed, never really existed. Between the sixth and tenth centuries A. D., western Europe may have suffered a recession of the Roman culture, which it had in any case never enjoyed for very long; under the trampling feet of barbarian invasion the torch of Rome itself may have been almost extinguished; but in the lands around the eastern end of the Mediterranean, which are the real original home of our somewhat misnamed "Western" civilization, the light of culture never even burned low. From its brilliance in the hands of the Byzantine Greeks it passed to even greater brilliance in the hands of Arabic culture that built itself around the unifying conquests of the followers of Mohammed.

This is the thesis advanced by Dr. George Sarton, historian of science and research associate of the Carnegie Institution of Washington.

The trouble with the "orthodox" historians of the Middle Ages, Dr. Sarton points out, is that though they may be good Latinists they cannot read Arabic; and it was in Arabic that almost all progress in science and culture were recorded, and continuity with the past maintained, from the time of Mohammed until the middle of the eleventh century.

This does not mean that the brilliant civilization of the Moslem empire, which stretched from central India to the then "wild and woolly West" of Spain, was exclusively the work of the Arab conquerors. On the contrary, when they first launched into their career as world masters, Dr. Sarton says, they were not much better off culturally than our western Indian tribes. But they were remarkably apt pupils, learned with miraculous rapidity the lessons which Byzantine Greek civilization could teach, and in two centuries rose to as high an intellectual level as any people has ever reached.

At the same time, the culture they established proved itself adaptable and absorptive toward the educated minds among the many races the Arabs ruled. Among the learned men identified with the Arabic culture of that long period there were at least as many Christians and Jews as there were Arabs. Their adaptations of Greek learning and their extensions of science carried them to primacy in such fields as astronomy, mathematics, medicine, physics and chemistry.

They influenced cultures outside their own. The greatest of Jewish philosophers, Moses Maimonides, wrote not in Hebrew but in Arabic; and Arabic influences are now acknowledged to have been strong in the development of St. Thomas Aquinas, founder of scholasticism, which was the bridge between medieval and modern thinking.

The cultural chain therefore is complete and unbroken, Dr. Sarton points out: from the Greek to the Arabic culture, and from that to the high European civilization of the later Middle Ages and modern times.

Science News Letter, March 10, 1934

PHYSICS

Institute of Physics Dedicated to Einstein

DEDICATION of the new Einstein Institute of Physics at the Hebrew University of Palestine took place Tuesday, March 6, in the presence of a gathering which included high officials of the Palestine government, noted scientists, and friends of the University.

Research in the new Institute will be divided between the purely scientific and the more directly applied aspects of physics. An important part of the program will be work on the analysis of light, or spectroscopy. At the same time, a laboratory for the testing of building materials and other commodities is to be placed in commission, and is expected to have an important influence on the Palestine reconstruction program.

Science News Letter, March 10, 1934

METEOROLOGY

Harm Not Expected From Snow and Rain

RECENT heavy rains in the watersheds of the southern tributaries of the Ohio river have brought them up to flood stage, but as yet they do not threaten any serious harm, meteorologists of the U. S. Weather Bureau informed Science Service. High water has been reported in both the Tennessee and Cumberland rivers, but not enough to interfere with the working programs of the various TVA projects.

The ice has started to go out of the Allegheny and Monongahela rivers at Pittsburgh, and the Ohio at that city, as well as at other points downstream, has been reported at full, but not approaching a dangerous flood stage.

The February cold waves that invaded the South with snow did not leave enough of it to cause trouble by its melting. The present high water in Southern rivers is due almost entirely to rain, and unless further heavy rains follow soon, there is little prospect of more than average spring freshets.

Science News Letter, March 10, 1934

ASTRONOMY

Meteors Declared Larger Than Previously Thought

WHEN YOU see a "shooting star" flash in the sky, and quickly repeat the incantation, "Money-money-money!" that brilliant little natural rocket may be making a more substantial contribution to the earth than it is commonly given credit for.

"Shooting stars," or more properly meteors, are little brothers to the great meteorites of iron or stone that occasionally roar through the sky and plump into the earth—as a rule, fortunately, without doing anybody any damage. The tiny meteorites that make "shooting stars" are stated by most astronomers to be probably no larger than grains of sand or pinheads; but H. H. Nininger, curator of meteorites of the Colorado Museum of Natural History, Denver, thinks otherwise.

In a lecture before a Washington audience of scientists, Mr. Nininger called attention to the intense scoring and pitting of the big meteorites which have been collected, by the friction of the air as they rush through it. This air-blast, he said, is more intense than the blast of white-hot gases from the muzzle of a gun, and it erodes in the solid iron or stone of a big meteorite pits that you can put your hand into. Its erosive action on a small object would be greater rather than less, he believes, so that probably we should think of the bits of solid stuff burned away to make our "shooting stars" as objects much larger than sand grains.

In answer to the frequent question about the danger to human life and property of big meteorites falling like giant projectiles from the heavens, Mr. Nininger cited a calculation he made when he was in Kansas some time ago, on the basis of the known area and population of the state and the known cases of meteorite falls in that area. This calculation showed that the chances of a man being hit by a meteorite are so small that such a casualty would occur not more than once in fourteen thousand years.

Science News Letter, March 10, 1934

ENTOMOLOGY

Florida Fruit Fly Scare Aided Pure Entomology

NEW TRUTH was found in the old adage, "It's an ill wind that blows nobody good," in connection with the invasion of Florida by the Mediterranean fruit fly a few years ago. Entomologists, of the "applied" or "economic" branch of their profession, finally drove the dreaded pest out again, but in the meantime they had to deal with thousands of specimens of less harmful flies belonging to the same family.

As a result of their collecting and cage-rearing labors, many new facts in "pure" entomology were discovered, and a number of interesting new species of the insects made known to science. All this has required time for digestion and evaluation; but the good blown by the ill wind that carried the fruit-fly invasion to our shores has at last become manifest in a new scientific publication by the U. S. Department of Agriculture, worked up by Foster H. Benjamin of the Bureau of Entomology. Mr. Benjamin's just-published bulletin has no immediate money significance; but science, which like a good housewife patiently stores all manner of "useless" things, sometimes for many years, may one day confound the practical-minded by pulling some apparently insignificant fact out of it, and making it worth a million dollars.

Science News Letter, March 10, 1934

IN SCIENCE

SURGERY

Woman's Stomach Yields Four Dozen Teaspoons

FOUR DOZEN teaspoons were among the objects removed from the stomach of a woman patient at the State Hospital in Central Islip, N. Y. She was admitted to the hospital suffering from melancholia with suicidal tendencies.

In reporting her case to the *Journal of the American Medical Association*, the physicians, Drs. E. Raymond Hildreth of Bay Shore and Robert B. Casey of Central Islip, state that besides the forty-eight teaspoons, they removed from her stomach one teaspoon handle, three bolts, one nut, one prune pit, one button, one small piece of glass, two pieces of spring wire, one needle, one piece of cinder, one hair pin and one lead pencil. The patient recovered from the operation but her mental condition has continued disturbed.

Science News Letter, March 10, 1934

AVIATION

Glider Flying Now Part of Navy Aviation Course

GLIDER flying is no longer a novel experiment.

Experiments in using gliders in teaching students to fly were so successful that the Navy has put in an order for gliders which will be used in regular flight training at the training school at Pensacola, Fla.

Beginning in June, one half the men in each class will start their aviation training with a course in glider flying while the rest proceed with the ordinary course of training. The instructors want to find out whether students given the glider training first will learn to fly more quickly and make better aviators. Four students who have already been trained in this way, upon completion of the glider training, joined a class of students who had had at least ten hours dual and two hours solo flying. They were able to keep up with the rest quite satisfactorily.

Science News Letter, March 10, 1934

NCE FIELDS

ARCHAEOLOGY

Chewing Gum Hunt Leads To Unknown Mayan Ruins

IN A HITHERTO unexplored region of southeastern Campeche, Mexico, an expedition has discovered the ruins of an important center of the great Mayan civilization.

Announcing the discovery, the Carnegie Institution of Washington said that the expedition, directed by Karl Ruppert, staff archaeologist, was dispatched from Chichen Itza, in Yucatan, to investigate reports that natives seeking new sources of chicle, chewing gum raw material, had found an unknown ruined city in a wild region of Campeche.

Twenty sculptured stone monuments were found among the ruins, and dates on some have already been deciphered. They show that the place was occupied during the Old Empire of Mayan history, which ended in the seventh century A. D., when many cities were abandoned mysteriously in waves of northern migration.

The discovery is said to fill in a blind-spot in Mayan history, for the region of the ruins is geographically midway between the Old Empire cities of southern Yucatan and the New Empire cities farther north.

Science News Letter, March 10, 1934

MARINE BIOLOGY

Meat-Eating "Sea Lilies" Collected by Smithsonian

NEW SPECIES of submarine "flowers" that are really hungry animals have been brought to the U. S. National Museum by the Johnson-Smithsonian expedition. They are crinoids, better known as "sea-lilies," special subjects of study by Austin H. Clark, the Museum's curator of echinoderms.

Crinoids are relatives of starfishes and sea-urchins. For purposes of simplification, a crinoid might be thought of as a starfish turned upside down, with a stalk that anchors it to the bottom; though it might not at first be recognized as closely related to a common starfish, because in many species the arms are branched out into delicate feathery patterns.

One peculiarity of crinoids that has prevented the collection of perfect specimens until recently is their habit of breaking off their arms when attacked or disturbed. This is a defense reaction, presumably useful in preserving them from their natural enemies; and they carry the behavior over into their response to the grab of a deep-sea dredge. Another peculiarity that militates against their becoming good museum specimens is the readiness with which they lose the frequently beautiful colors they have when alive.

Though they are animals and always hungry, crinoids are usually satisfied with small prey: the minor plants of the sea, and small animals related to shrimps and crayfish. These they paralyze with poison secreted by the tentacles lining the grooves in their arms, which carry the food to the centrally placed mouth.

Science News Letter, March 10, 1934

RADIO

Auto Ignition Sparking is Short Wave Radio Trouble

NOISY and unintentional "broadcasting" by the ignition systems of automobiles menaces the utilization of high frequency or short wave radio by the public, Virgil M. Graham, engineer of the Stromberg-Carlson Telephone Manufacturing Company, warned the Society of Automotive Engineers. Automobile owners who have had radio receivers in their cars have already discovered the necessity of shielding the ignition systems in order that there will not be interference with their reception of broadcast music and speech.

Even more important, in the opinion of Mr. Graham, is the interference of automobile ignition systems with radio receivers in other services. The popularity of so-called all-wave receivers is bringing this problem acutely to the attention of the public. He urged automobile manufacturers as a routine to so equip their cars that the ignition system does not send up a barrage of electrical signals that cause interfering noise in radio receivers.

Interference from automobile ignition systems is becoming more important as ultra-high radio frequencies are used for police work, aircraft landing beacons, and other such uses.

Science News Letter, March 10, 1934

PHYSIOLOGY

Smoking Pleases Because It Sweetens

YOU GROW sweeter when you smoke.

The gratification you get from smoking, particularly when you are tired and hungry, is due to an increased amount of sugar in your blood brought about by the nicotine from your cigarette—or pipe or cigar. This explanation of what has long been a mystery has just been reported to *Science* by two Yale University scientists, Drs. Howard W. Haggard and Leon A. Greenberg.

The nicotine in the tobacco acts upon the adrenal glands, causing them to discharge more adrenalin into the system. As a result, the glycogen stored in liver and muscles is converted to sugar, and the sugar concentration of the blood is increased.

The same thing happens after a meal. It is this increased sugar concentration that definitely relieves the fatigue and irritability which develop when the amount of sugar in the blood is at the fasting level, in other words, when you are hungry. This also explains why many tobacco users smoke when they feel tired or hungry. The nicotine relieves the hunger and fatigue temporarily by increasing the amount of sugar in the blood.

The discovery of the reason for tobacco's gratifying effects was made accidentally by the Yale scientists. They were investigating the question of the optimum mealtime interval—how often children, college students and industrial workers should be fed. The concentration of sugar in the blood was examined and other tests made every hour throughout the day on many persons. The blood sugar concentration rose after a meal, fell to the fasting level within two to four hours if another meal was not taken, and in most subjects remained practically unchanged at that level for many hours. In a few of the adults, but in none of the children, the blood sugar concentration showed sudden big rises and falls after it had reached the fasting level. It was suggested that smoking might explain these fluctuations. Subsequent investigation proved the suggestion to be correct and led to the discovery, apparently for the first time, of the reason for the gratifying effects of tobacco smoking.

Science News Letter, March 10, 1934

ARCHAEOLOGY

Oldest Theater

Ruins From Glamorous Crete Reveal Stone Stage and Seats Used 1000 Years Before the "Old" Greek Theater Evolved

By EMILY C. DAVIS

THE WORLD'S first theater—did you ever wonder where it was, and whether it had plush seats, and whether the curtain stuck temperamentally when frantic stage hands tried to hide the business of shifting scenes?

Historians have pointed to the Theater of Dionysus in Athens when they were asked how the theater began. The curved auditorium with its stage in front, they neatly explain, grew out of the old Greek custom of sitting on a grassy hillside and watching the exciting dances to the god of wine and fruitfulness, performed in an open space at the foot of the hill. And that is where we got our theater, so the accepted explanation ran.

But that was not the beginning of theaters, archaeologists now realize. That "old" Greek theater evolved only six or seven centuries before Christ. Civilizations had been working out their destinies for thousands of years before the Greeks.

An Italian archaeologist, Prof. Luigi Pernier, pushes theater history away back to 2000 B.C.

He carries you from Greece southward to Crete in the blue Mediterranean. There he points to the ruins of the Palace of Phaestos, on a hilltop overlooking the sea. And in one corner of the palace is a stone construction which makes true ancient history for the theater. It is an unmistakable theater, planned and built for a prince who lived a thousand years and more before the Greeks converted hillsides into galleries.

About 2000 B.C., the Island of Crete was a small kingdom in the sea where civilization and elegance and beauty had begun to flower extravagantly. Knossos was the royal capital. But princes ruled over local districts, and Phaestos was the capital of such a province.

The Italian Archaeological Mission in Crete, under the leadership of Prof. Pernier, has for some years been digging out the ruins of Phaestos. Buried in the earth are the floors of the palace, the stairways, and stumps of walls. The digging reveals some of the vases and art objects that adorned the stone palace. The earth also has preserved attractive drinking cups and pitchers and basins used by the palace household.

The prince's palace cannot compare in splendor with the Palace of Minos which Sir Arthur Evans unearthed at Knossos some years ago. That Palace of Minos first showed an astonished modern world that Crete, long before Greece or Rome, was one of the glamorous places of the earth. Earthquakes and time had buried the remains of Crete so effectively that it almost lost its rightful place in the history of civilization. Now, these ruins are being examined and the part that Crete played, its influence on Greece and other countries, is more fully understood.

"Plan is Easily Seen"

The theater, found at Phaestos, is one of these long-lost fragments of history.

Prof. Pernier, deeply impressed by the meaning of the ruins, writes:

"One cannot doubt the theatrical as well as the monumental meaning of the construction. I have seen here the oldest theater in the world, which archaeological excavations have returned to light."

It is simple, yet complete, that first theater. Even wrecked by time, the plan is easily seen.

There is a large oblong space paved with limestone flags. That is the stage. On two sides of this stage rise broad steps. One flight is a stairway leading to palace rooms. But the other flight is blocked at the top by a high wall, like the back wall of a gallery, showing plainly that these stairs were never meant for transportation. These are the theater seats. Up the middle of the tier is an aisle of slightly raised steps.

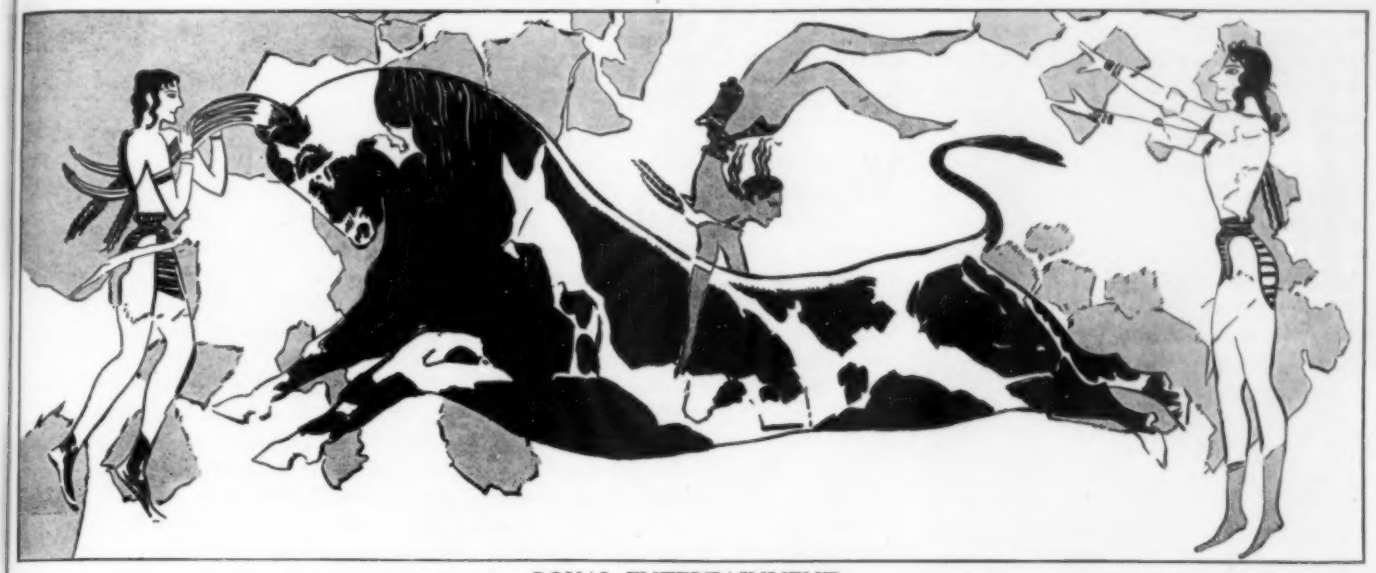
All the complicated mechanism and equipment of the Berlin Opera House or New York's newest theater are still based on the plan of the Cretan prince's theater of 4000 years ago. The unknown father of the theater—perhaps the prince himself—provided a stage, raised seating for the spectators, and an aisle. That was the basic patent, so to speak, of the theater form.

Diagonally across the stage of the ancient theater was installed a feature that did not become a part of the theater's basic patent. It was not really a very good idea. It was a slightly raised, paved walk, leading straight from the palace entrance right across the stage to the theater aisle. When the prince and his friends attended the theater, they came in with pomp and ceremony. The men wore elaborate curls and rather nondescript clothes. The women were more decorative, in flounced, tight-waisted dresses with puff sleeves and with tiaras on their curled and carefully arranged hair.

The diagonal walk offered a fine chance for a grand entrance, but it must have caused grief to any performer who stumbled over its raised stones.

ALL THAT REMAINS *Photo by Prof. Pernier.*

These ruins at Phaestos, in Crete, are pronounced the oldest theater in the world.



ROYAL ENTERTAINMENT

Daring bull acrobatics, most breath-taking stunts ever performed on a theatrical stage, were seen in the oldest theater.

Another raised line of flagstones served the useful purpose of keeping back rainwater, so that it would not flood the stage. The water was drained off toward a circular cistern nearby.

While not very interesting to look at, that flagstone line tells a good deal about scenes in this early theater. It would appear that events held there were important, and could not always wait for the sun to dry up the stage after a rain. The prince and the court could bring out cushions—as archaeologists believe that they did—when they took their places on the stone steps. But a wet and slippery paving for the stage would not do, and drainage was provided.

The Actors

Who were the actors on that ancient Cretan stage?

Not athletes, probably. Prof. Pernier believes that boxing and wrestling matches to amuse the prince and his household must have been held in another part of the palace. He has found a certain room with columns which seems more suitable for that sort of entertainment.

The theater, Prof. Pernier says, would have been reserved for unusual events.

The first productions in the ancient Cretan theater were doubtless religious. The actors were priests and others taking part in religious spectacles. That does not mean that the scenes were dull. Far from it. Drama was in the blood of the people of Crete.

Religious events in Crete called for music of flutes and lyres, and singing. At times, maidens and youths danced their emotions before the Cretan goddess. These dances were noteworthy enough for the Greeks to be still talking about them, centuries after.

Coiling, twisting snakes were symbols carried by the Cretan goddess, and perhaps also by her priestesses in calm dignity. In the holy processions the ruler himself took part, as priest-king.

Most spectacular of all were the dangerous bull-grappling contests. Daringly, boys and girls of Crete risked their necks doing acrobatics with the sacred bulls. But these bull acrobatics, Prof. Pernier believes, did not gain wide vogue in Crete until about the sixteenth century B. C.

By that time, the first palace of Phaestos had met with disaster and was burned to the ground. It was rebuilt, and the theater was now larger with a flat stage, clear of fancy raised sidewalks. With a new "opening," the historic theater of Phaestos—now three or four hundred years old—was ready for the great religious circus events of the day.

All that is really known of these sports between bull and man is what Cretan artists depicted on walls and art objects. The pictures reveal acrobats doing feats so difficult that some modern athletes have flatly said, "impossible."

Yet these vivid, lively figures cannot be mere dreams of ancient artists. Archaeologists, who have analyzed the pictures, point to the well drawn muscles of the toreadors, and the veins in their hands. Such careful drawing was made from life.

Describing one great scene shown on a fresco in the palace of Minos, Prof. Pernier says:

"While the bull charges with his head lowered, a girl leaping over his horns, succeeds in lifting herself over them with her arms; so that the bull raising his head tosses her over and propells her to a successful completion of the dangerous leap, ending on his back.

"A boy has preceded her in the hazardous deed, and we see him in the act of completing the feat on the bull's back. Another girl, standing at the back of the beast, is ready to catch him with her arms."

The fact that assistants were stationed to aid the performers in landing is thought significant. It seems to mean that the somersaults and leaps, with a huge bull as a springboard, were often done in a limited space, rather than in a broad arena. It is supposed that in the theater of Phaestos and in other gathering places, there were wooden palisades set up to protect the audience from too close contact with danger, and also to provide a resting place for the toreadors, who could dart back of the fence.

Not Duplicated

The theater of Phaestos, so far as is yet known, was not duplicated in Cretan cities. The king's palace, at Knossos, had a theatrical area, but Prof. Pernier objects to calling it a theater. It had no special construction of tiers of seats with an aisle and other planned theatrical provisions. The king's guests gathered on palace stairways and land-

ings around open courts when public spectacles were held. It remained for a less eminent person, a princeling of Crete, to make the dramatic gesture of building a place just for theatricals.

Crete, more than Egypt or Babylonia or other ancient lands, seems fitting soil for the sprouting of the theater germ.

In the other countries, religious spectacles were staged mainly in temples. The sacrifices and processions moved often in forests of columns. What the people could not see was just that much more mysterious and impressive.

Even Egypt's great passion play of the life of the god Osiris, which lasted for days, was a progressive affair moving about the city, now taking form as a procession, now a pageant scene, now a sham battle.

But religious and sporting events in Crete were so eye-filling and exciting that the Cretan public naturally wanted to see, and to see clearly. They would certainly have objected if admitted to a spectacle and then forced to see through pillars or over tall heads and shoulders. There had to be a theater.

Science News Letter, March 10, 1934

MEDICINE

Cancer Research Center Established At Wisconsin

UNIVERSITY of Wisconsin officials and medical workers at Madison are jubilant at the prospect that the University may soon have one of the foremost cancer research centers in the country. The University has just received a bequest of $300,000 from the late Miss Jean Bowman of Wisconsin Dells to found a cancer clinic and research center.

The state university has, at the present time, a cancer clinic centering about the Wisconsin General Hospital, which has been doing considerable clinical research work on cancer malignancies, but studies have been retarded due to lack of funds. Dr. E. A. Pohle, professor of radiology in the university medical school, is chairman of the Cancer Clinic and will probably head whatever clinical research work is decided upon for the new center.

Science News Letter, March 10, 1934

The American corn plant found its way to China some time before 1573, probably by the longest route—that is, carried to Europe by Spaniards, then to Mecca by Arabs, and thence through central Asia to China.

BIOPHYSICS

Growth of Common Fungus Speeded by "Heavy Water"

WATER containing a very small proportion of the "heavy water" with double-weight hydrogen atoms was again proved to act as a stimulant to plant growth, in experiments performed by Samuel L. Meyer of the Vanderbilt University biology department, and reported to *Science*.

Mr. Meyer used water in which one out of every 214 hydrogen atoms was of the double weight variety, or "deuterium." With this he prepared nutrient solutions in which he grew cultures of the common blue mold that sometimes spoils oranges. On other solutions, containing no heavy water, he grew "control" cultures. After drying out the growths he compared their weights.

He found that the cultures grown on the heavy water solution weighed about sixteen times as much as the "controls" grown without heavy water. They gave evidence, moreover, of having remained more strongly in the vegetative state, whereas the "controls" had matured and passed over into the fruiting state.

Mr. Meyer therefore concludes that his experiments confirm those of other research workers who experimented on other forms of plant life, indicating that while high concentrations of heavy water act as poisons, very dilute solutions have a tonic effect, stimulating vegetative growth.

Science News Letter, March 10, 1934

GENERAL SCIENCE

Honor Rewards Suggested For U. S. Scientists

"DOCTOR," asked a member of the House subcommittee on appropriations for the Department of Agriculture, "Do you have any compensation, either of distinction or of salary, with which to reward the men in the Department who make particularly valuable contributions to science or commerce?"

"No," replied Dr. Henry G. Knight, chief of the bureau of chemistry and soils.

Dr. Knight had just been discussing a new mineral oil process for the preservation of eggs worked out in the Department, also the use of a certain type of green paper for wrapping oily foods, such as potato chips and peanuts, so that they will not become rancid over long periods of time.

"The paper," he said, "is called 'Coe green' after the name of the man in the bureau who originated it and developed the process. We have a public service patent on this so that anybody may use it. It is dedicated to the public. The vacuum carbon dioxide oil process for the preservation of eggs is also covered by a public service patent, but it is not yet in commercial use. Anybody can use that process."

House members were interested. One of them suggested that there should be a distinguished service cross or some method of recognition for the research worker. Just naming a paper bag or a process after the scientist who does valuable and strikingly original work, the Congressmen felt, was not quite enough.

Dr. C. A. Browne, chief of chemical and technological research in the bureau, pointed out, however, that the scientist is always entitled to the foreign rights and patents.

Dr. R. W. Skinner, assistant chief, chemical and technological research, said that unless the bureau published a report of the scientist's work and the patent number that some outsider might be able to get the patent in this country. "It has been done," he stated.

Items of interesting food research that held the attention of committee members were:

Utilization of turnips to make a sauerkraut "practically as satisfactory as that made from the cabbage."

Use of "apple wax" as an ingredient for automobile and furniture lacquer so that this quick-drying paint may be applied with a brush instead of being sprayed on. This process opens up a market for apple culls.

Use of pineapple juice on apples cut for drying, so that they will not turn dark.

Methods for handling soft-textured grapefruit in Texas for canning or putting up grapefruit juice.

Apple sirup for hot cakes, which is of finer flavor than the present commercial concentrated cider, due to the addition to the sirup of the first distillate, which carries the bouquet of the apple.

Curtailment of regular agricultural departmental funds for 1935 for agricultural investigations by $40,301 will mean, Dr. Knight said, that there will be no studies on flavors and fermentations of sirups; such studies as the apple wax utilization will be cut about $5,000; and others in similar amounts.

Science News Letter, March 10, 1934

READ OVER THE SHOULDERS OF GIANTS

HOW BETTER can we read of the deeds of the great men of science than from over their shoulders as they write their own impressions of the discoveries that have built the world we live in. No matter how often or how well a story has been told there is still a fresh thrill in reading it as it was told the first time.

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BELIEVED HIM TO BE NIMROD

The first archaeologist to find the site of Nineveh describes the discovery of a gigantic statue in the temple gateway. (Layard, "Nineveh," SNL No. 529).

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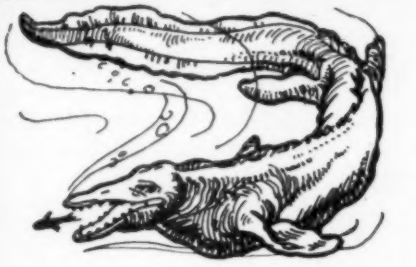
SCIOLOGY

NATURE RAMBLINGS
by Frank Thone



Superstition, Science's Jackal

SUPERSTITION always shows a curious parasitic dependence on science, supposed to be its bitterest arch-enemy.

The current "silly season" of sea serpent stories affords an excellent case in point. The things which people have seen, or think they have seen, in Loch Ness, Puget Sound and other places, have been very commonly given the shapes, in their more or less excited descriptions, of the swimming saurians that dominated the seas of the Mesozoic era, which was the Middle Age of geology. Men still call the apparitions sea serpents, but they picture them as ichthyosaurs.

Before the rise of paleontology as a well-organized science, and especially before its popularization by such fascinating imaginative romancers as H. G. Wells, the strange wonders seen by them that go down to the sea in ships most often took the form of monstrous snakes. This was natural enough. Serpents were locally known as objects of fear, and there was good Scriptural warrant for regarding them as endowed with even supernatural powers of evil. Added thereto were the meager and hence often exaggerated descriptions that driftd back into Europe, of the huge constrictor-snakes of the tropics, seen by a few hardy travellers, or perhaps only described to them by tellers of tall tales in the bazaars who saw a chance to pull a greenhorn's leg.

Ancient superstition and modern superstition were thus alike, in that they fed on the best natural knowledge available at the time.

But it is not only in natural history that superstition has persistently dogged the heels of science, parasitically living on decayed scraps of more authentic knowledge. There is hardly a field of science that does not have its left-handed image in the looking-glass world of superstition.

Anatomy had hardly got itself thoroughly established in modern times when phrenology fastened itself on the human skull, like a leech with an appetite for bone instead of blood. Phrenology has seen its best days; it is still practiced in the shabbier quarters of our cities along with palmistry and other cheap necromancies. Its vogue as a really fashionable superstition (and therefore as a racket fat in cash returns) has long since been hauled to the boneyard. Yet fragments of it persist, even at that, ranging from "character reading" from faces to the determination of political pogroms against people with "wrong" skull shapes.

Again, though early astronomers shamelessly practiced astrology, and some of them probably believed in it, the divorce between them has long since been complete, at least on the part of science. But astrologers were quick to seize on the discovery of the planet Pluto a few years ago; and there is a regular nest of astrologers' "studios" in Chicago, as near as they can get to the Adler Planetarium.

Thus is the lion of Science never without its following jackal of Superstition. The lion may at times turn and roar at the jackal, but he never gets rid of him.

Science News Letter, March 10, 1934

ORNITHOLOGY

Ambitious Woodpeckers Disrupt Electric Service

WOODPECKERS have long been notorious for drumming and drilling away at objects of no possible profit to them—tin roofs, for example—for no apparent reason other than sheer pride of artistry. But a South Carolina power company sends in a woodpecker story that tops them all.

The company had been using a type of outdoor cutout fuse installation in which the soft fuse wire was partly exposed. More of these cutouts were opening than it was reasonable to expect, but no solution to the mystery was forthcoming until one day one of the engineers happened to see a woodpecker at work on one of the soft-wire fuses. The company promptly substituted a fuse in which the exposed part was of copper, too tough for the birds' beaks. That put an end to the trouble.

Science News Letter, March 10, 1934

GENERAL SCIENCE

Science Seen as Aiding Totality of Human Advance

SCIENCE, under controversy in many quarters as a prime contributor to the present disturbed condition of the world, was pointed out as a possible and even necessary contributor to world recovery and further progress, by Dr. John C. Merriam, president of the Carnegie Institution of Washington, who addressed at Philadelphia the American Philosophical Society, America's oldest scientific organization. Like the long-discussed conflict of science and religion, the assumed clash between natural science and social science is possible only when there is interference with normal exchange of ideas, Dr. Merriam declared.

Much of Dr. Merriam's address was concerned with the problems of conservation, and the ways in which science can come to the aid of economic reconstruction and sound long-time planning for future generations. Natural resources of the irreplaceable type, like oil and minerals, hitherto recklessly and wastefully exploited as they have been discovered, largely by chance, can be much more wisely administered if the extent and availability of their deposits are mapped out by scientific surveys, and if science is further invoked in working out methods for their most efficient use. Resources that renew themselves in humanly measurable time, like timber and game animals, are even more susceptible to scientific management.

But conservation can serve more than man's bread-needs alone. Dr. Merriam pointed out the possible services of science in the preservation or restoration of natural areas fitted for esthetic enjoyment, educational development, and even religious contempla- (*Turn page*)

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"Nature is the living, visible garment of God"—Goethe.

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tion. The national parks of America and the great temple groves of China were indicated as already existing examples.

Finally, science must contribute its share toward answering the difficult question of what things, both in the material world and in the domain of social relations, must be adhered to as that which is good, and therefore to be defended against tendencies of change, and what things are legitimately subject to further evolution, whether through the ordinary processes of nature or through the hastening aid of man.

Science News Letter, March 10, 1934

ETHNOLOGY

White Man Smokes Often, Red Man Smokes Hard

THE WHITE MAN'S way of smoking is funny, as California Indians look at it. No sense to it, in fact.

When a California Indian smokes his wild tobacco, he takes it in one knock-out dose.

The Indian smoker puts the "makings" into a hollow elder stick about eight inches long, from which the pith has been removed. Then he inhales a few long whiffs. A few are just enough to make him so dizzy that he cannot stand on his feet. When he can see straight again, he puts away the pipe and tobacco until tomorrow. He has had his smoke for the day.

Describing this procedure, which he has observed and discussed with the Indians, John P. Harrington of the Smithsonian Institution says that the Indian looks upon the white man's smoking all day as absurd, with no justification in common sense or tradition. When Mr. Harrington asked the Indians why their way of smoking was better, they gave the good old Indian answer, that their ancestors had always done it that way.

Physiologists have been working hard to explain why modern smokers do smoke through the day. Yale physiologists very recently reported that the sugar in the blood temporarily increases by the smoking process. That seems to promote a feeling of bodily wellbeing.

When they get round to it, the physiologists might look into the effect of the red man's heroic inhalation of tobacco. Perhaps there is some unknown physiological reason why the Indian smokers prefer their tobacco hard and straight.

Science News Letter, March 10, 1934

•First Glances at New Books

Archaeology

ARCHAEOLOGICAL TOURS FROM MEXICO CITY — R. H. K. Marett — *Oxford Univ. Press,* 117 p., $1. To visit Mexico City and not see and understand something of its prehistoric side is like visiting Athens and ignoring its antiquities. This pocket guide is excellently adapted to the tourist's needs. It is not only logically arranged, and supplemented by illustrations and directions for going and coming, but it has an attractive manner of telling about the ruins and the ancient Aztecs, Toltecs, and Archaics, who built them and lived in them.

Science News Letter, March 10, 1934

Education

THE EFFECTS OF THE ECONOMIC DEPRESSION ON EDUCATION IN OTHER COUNTRIES—James F. Abel—*Govt. Print. Off.,* 37 p., 5c. Now that the support of schools has become such an acute problem in the United States, this view of matters in foreign lands is of great value.

Science News Letter, March 10, 1934

Philosophy

REALITY AND ILLUSION—Richard Rothschild—*Harcourt, Brace,* 432 p., $3.50. A substantial addition to the philosophical literature of challenge that has followed the disillusionment of the War, with its battering away of the clay feet of the mechanistic idol behind which man's self-worship of a half-century ago naively hid itself. The scientist may not accept the author's thesis; nevertheless it puts him on his mettle to prove his own, instead of calmly assuming it to be an axiom, and to prove further that science performs in a world of human meanings, not in a vacuum.

Science News Letter, March 10, 1934

Chemistry

A TEXT-BOOK OF INORGANIC CHEMISTRY — J. R. Partington — *Macmillan,* 1062 p., $4.25. The fourth edition of a comprehensive and detailed text for university use written by a University of London professor.

Science News Letter, March 10, 1934

Medicine

OBSERVATIONS OF A GENERAL PRACTITIONER—William N. Macartney—*Badger,* 478 p., $3. Here is an informally written book for the general practitioner, particularly the young man entering general practice. The author is himself a country doctor. His book is a blend of philosophical comments and practical advice on the treatment of various diseases and the practice of medicine in general.

Science News Letter, March 10, 1934

Geography

SIXTH REPORT OF THE UNITED STATES GEOGRAPHIC BOARD, 1890 TO 1932—*Govt. Print. Off.,* 834 p., 80c. If you want to know whether to write Pittsburgh or Pittsburg, and what is the officially correct name of some lake or mountain called by several names, this report may supply the answer. It contains practically all the decisions of the geographic board for the period named in the title, and these are arranged in dictionary form, hundreds of pages of them. The geographic nomenclature of the Eastern Hemisphere has changed so greatly since 1914 that the board has drawn up a new list of some 2,500 of the more important names and has included them in this reference work.

Science News Letter, March 10, 1934

Botany

FLORA OF THE KARTABO REGION, BRITISH GUIANA—Edward H. Graham *Carnegie Museum (Pittsburgh),* 275+xxiv p., 18 pl., $2.50.

Science News Letter, March 10, 1934

Psychology

RESISTANT BEHAVIOR OF PRESCHOOL CHILDREN — Ruth Kennedy Caille — *Teachers College, Columbia Univ.,* 142 p., $1.50. One cannot predict from a child's resistance in one situation what his degree of resistance will be in another situation. Neither is it possible to divide children into types: resistant and non-resistant or aggressive and non-aggressive.

Science News Letter, March 10, 1934

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